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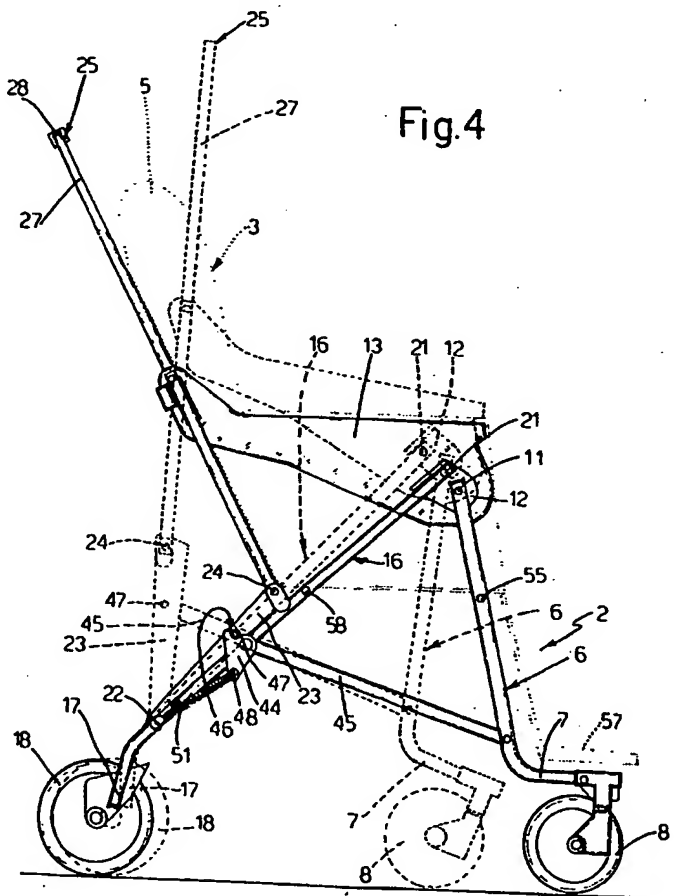
(58) Field of search

B7B

Selected US specifications from IPC sub-class B62B

(54) Foldable pushchair

(57) A push-chair comprises a collapsible load-bearing structure (2) and a collapsible body (3), the structure (2) comprising two pairs of side bars (6 and 16) supporting a respective wheel (8 and 18) and defining two respective V's, and a system of levers (23 and 44) which when locked together lock the side bars in the open position by means of tension rods (45), and to enable the side bars (6 and 16) to be turned towards each other for collapsing the push-chair when the levers are released by pressing on a transverse bar 48 to release notch 46 on lever 44 from peg 47. Also described is a mechanism which enables the handlebar to be positioned in a forward position such that the pusher faces the baby.



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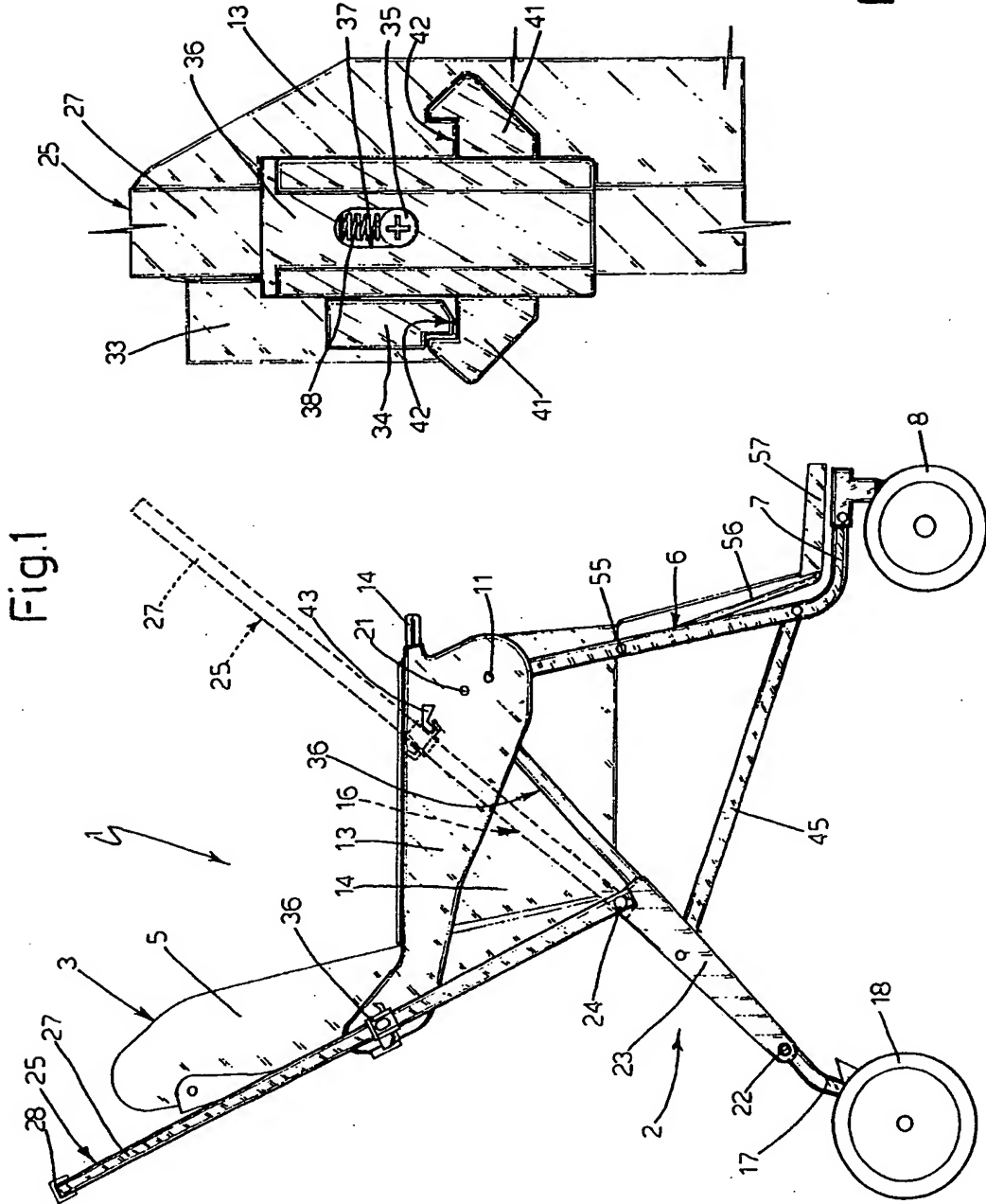


Fig. 3

Fig. 1

Fig. 2

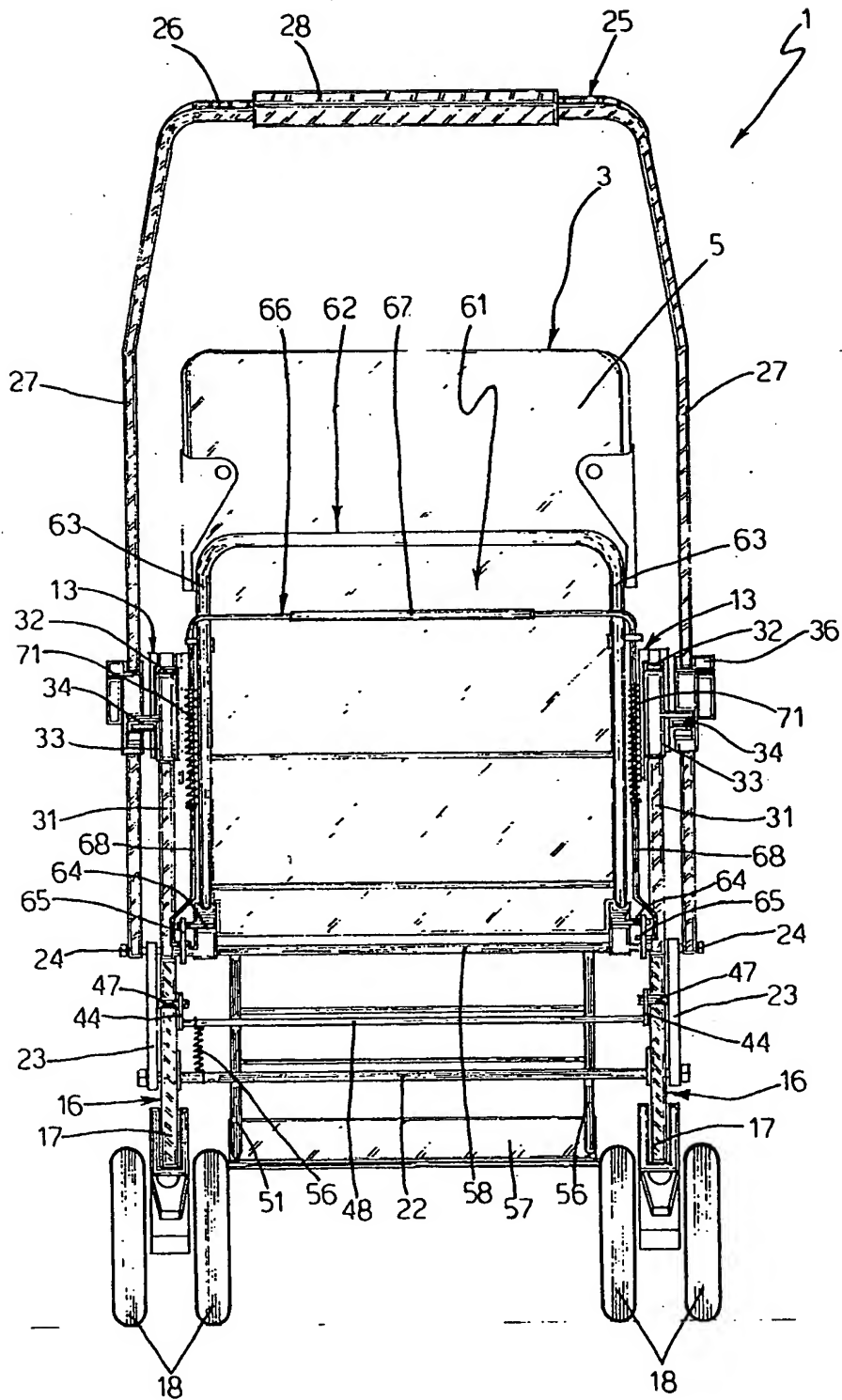
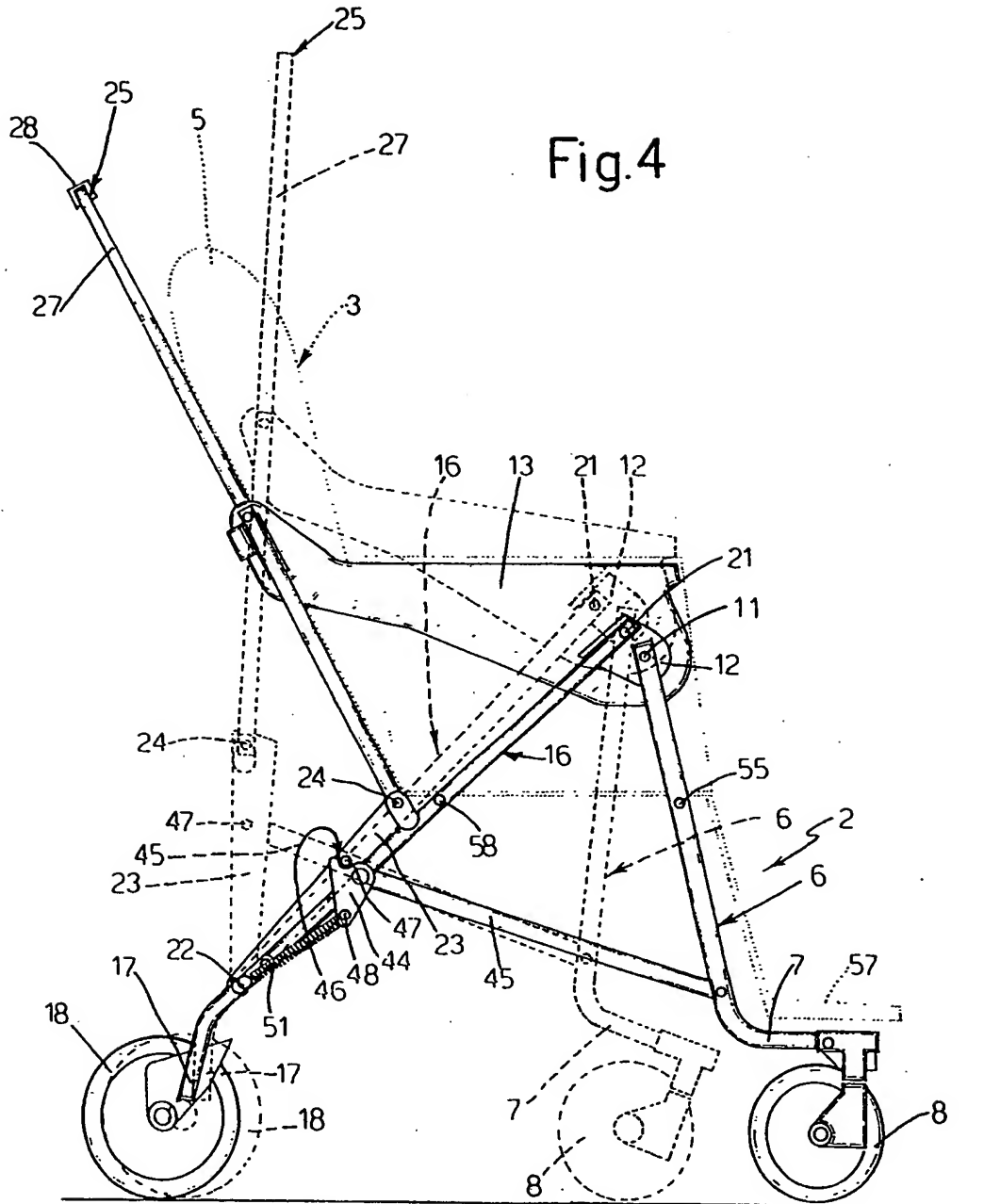


Fig.4



SPECIFICATION

Push-chair with a perfected fold-up system

- 5 The present invention relates to a push-chair with a perfected fold-up system.

Various types of push-chairs are currently available on the market, featuring various types of fold-up systems, all of which, however, are of complex design and difficult to operate.

- 10 The aim of the present invention is to provide a push-chair comprising a fold-up system which is both straight-forward in design and easy to operate.

Further aims and advantages of the present invention will be disclosed in the following description.

- With this aim in view, according to the present invention, there is provided a push-chair with a perfected fold-up system, the said push-chair comprising a collapsible load-bearing structure fitted with a collapsible body having a backrest and a seat; characterised by the fact that the said structure comprises:
- two first side bars, each supporting, at the bottom, at least a first wheel, and each hinged at the top to a respective member located to the side of the said body;
 - two second side bars, each supporting, at the bottom, at least a second wheel, and each hinged at the top to a respective said member; the said first and second bars defining two respective V's with their tips in the respective said members;
 - two first levers, each hinged to a respective said second bar;
 - two second levers, each hinged to a first end of a respective third bar, the second end of which is hinged to a respective said first bar;
 - a fourth bar in the form of an upside-down U and having a centre portion constituting a handgrip, and two side arms, each connected to a respective said first lever; and
 - locking and release means between the said first and second levers, which levers may be locked in the open position, in such a manner as to cause the said third bars to act as tension rods between the said first and second bars, and released for collapsing the push-chair, by enabling the said first and second bars to be turned towards each other.

- A preferred embodiment of the present invention will be described, by way of a non-limiting example, with reference to the attached drawings, in which:

Figure 1 shows a side view of a push-chair according to the teachings of the present invention;

Figure 2 shows a larger-scale rear view of the *Fig. 1* push-chair;

Figure 3 shows a larger-scale view of a detail on the *Fig. 1* push-chair;

Figure 4 shows a side view of the push-

chair in the open position (continuous line) and as it is being folded up (dotted line).

- Number 1 in *Figs. 1* and 2 indicates a push-chair comprising a load-bearing structure 2 and a body 3 having a seat and a backrest 5. Both load-bearing structure 2 and body 3 are collapsible. Load-bearing structure 2 comprises two side bars 6 having a respective bottom end 7 bent substantially horizontally and supporting a respective pair of wheels 8. The top ends of bars 6 are hinged to a respective pin 11 integral with a respective bracket 12 (*Fig. 4*) fitted in integral manner inside a member 13 in the form of an upside-down U. The two members 13 are parallel and support respective side walls 14 of body 3 extending upwards from the side edges of the seat. The said walls 14 are preferably formed from a respective sheet of plastic material which may be folded when push-chair 1 is collapsed. Members 13 extend along the entire length of body 3, the upper portions of the said members 13 forming respective armrests. The front portions of members 13 support a front armrest to which, in use, is fitted a strap (not shown) extending from the front edge of the seat. The strap and armrest prevent the child from sliding out of push-chair 1.

- Load-bearing structure 2 comprises a further two side bars 16 having a respective bottom end 17 bent substantially vertically and supporting a respective pair of wheels 18. The top ends of bars 16 are hinged to a respective pin 20 (*Fig. 4*) integral with bracket 12. Bars 6 and 16 thus form two upside-down V's with their tips inside respective bracket 12 in the front portion of respective member 13. As shown in *Fig. 2*, close to their bottom ends 17, bars 16 are connected by a horizontal bar 22 to the free ends of which are hinged the bottom ends of respective levers 23. The top end of each lever 23 supports a respective pin 24 to which is hinged a respective free end of a bar 25 in the shape of an upside-down U and thus having a centre portion 26 and two side arms 27; the free end of each said side arm 27 being hinged, as already described, to a respective pin 24. The said centre portion 26, which is gripped by the user for pushing push-chair 1, is preferably covered with a layer of plastic material 28. To pin 24, there is also hinged the bottom end of a further bar 31 the top end of which is hinged to a pin 32 integral with the rear of member 13. The top end of bar 31 is located inside an appendix 33 also in the form of an upside-down U and extending from the rear of member 13. On the outer face of each appendix 33, there is formed a tooth 34.

- As shown in *Fig. 1*, bar 25 may be set, in use, to a first position (shown by the continuous line) wherein the user is positioned behind the child, and a second position (shown by the dotted line) wherein the user is positioned facing the child. As explained in more detail

later on, push-chair 1 may be folded up regardless of the position of bar 25. From a centre portion of arm 27, there extends an integral peg 35 (Fig.3). Over the said centre portion, arm 27 is located inside a sleeve 36 the outer face of which presents a through slot 37 inside which extends the end of peg 35. Inside slot 37, there is fitted a preloaded spring 38 which presses against peg 35 at the bottom and against the edge of slot 37 at the top. The function of the said spring 38 is to press sleeve 36 upwards. From the front and rear faces of sleeve 36, there extends a respective appendix 41 on the top portion of which there is formed a respective rectangular cavity 42 open at the top. With bar 25 in the position shown by the continuous line, cavity 42 of the left-hand appendix 41 in Fig. 1 is engaged by tooth 34. When sleeve 36 is pressed downwards, against the action of spring 38, tooth 34 is released from the said cavity 42. Bar 25 is thus free to turn clockwise into the position shown by the dotted line, wherein cavity 42 of the right-hand appendix 41 is engaged by a tooth 43 similar to tooth 34 and extending from member 13 close to the front portion of the same. The tips of teeth 34 and 43 and the ends of appendixes 41 are tapered so that, once free to rotate, bar 25 may be locked into either position by simply pressing it towards tooth 34 or 43. In fact, subsequent to such pressure being exerted, the tip of tooth 34 or 43 cooperates with the end of respective appendix 41 in such a manner as to cause sleeve 36 to slide downwards until tooth 34 or 43 engages respective cavity 42.

With reference to Figs 2 and 4, close to the centre portion of each lever 23, there is fitted a second flat, substantially triangular lever 44. To an upper tip of lever 44, there is hinged a first end of a bar 45 the second end of which is hinged to bar 6 close to its bottom end 7. On the top edge of lever 44, there is formed a recess 46 facing upwards and engaged, when push-chair 1 is open, by a peg 47 extending from the centre portion of respective lever 23. Levers 44 are connected together, on their respective lower tips, by a horizontal bar 48. Close to one end of bar 48, bar 48 is fitted integral with a first end of a preloaded spring 51 the second end of which is fitted to bar 22. The function of spring 51 is to pull bar 48 towards bar 22 and, observing lever 44 as shown in Fig.4, to press the top edge (recess 46) of levers 44 against pegs 47. Bars 45 form a respective tension rod between bar 6 and respective bar 16 for locking the opening of the V formed by the same.

Bars 6 are connected centrally by a horizontal bar 55 (Fig.4) to which are hinged (Fig.1) the top ends of two bars 56 the bottom ends of which support a footrest plate 57. Bars 16 are connected centrally by a horizontal bar 58

which, together with bar 55, acts as a support for the seat portion of body 3.

With reference to Fig.2, push-chair 1 is provided with a mechanism 61 enabling backrest 5 to be tilted back preferably into three positions. Mechanism 61, which is a known type employed by various manufacturers and, therefore, need not be described in detail, comprises a bar 62 in the form of an upside-down U for supporting backrest 5 with which it is integral. Bar 62 presents two side arms 63 from the free ends of which there extends outwards in integral manner a respective peg 64 designed to engage a through slot formed in a lever 65 hinged onto bar 58. The slot formed in lever 65 presents three recesses relative to the three positions to which bar 62 and, consequently also, backrest 5 may be set. A bar 66, in the form of an upside-down U and designed to slide parallel with itself in one plane, is supported in non-integral manner by bar 62. Bar 66 presents a centre portion 67 acting as a handgrip, and two side arms 68 the free ends of which are bent and integral with respective levers 65. Against the action of two preloaded springs 71, bar 66 may be slid upwards by turning levers 65 about bar 58. Such rotation of levers 65 shifts pegs 64 from one recess to another in the slots on levers 65, thus altering the position of bar 62 in relation to bar 58.

The main characteristic of the present invention consists in the structure being provided with a system of levers 23 and 44 which, if locked together, provide for locking together bars 6 and 16 by means of bars 45. When levers 23 and 44 are released by means of bar 48, the tension rod formed by bars 45 is relieved, thus enabling closure of the V formed by bars 6 and 16. In fact, for folding up push-chair 1, bar 48 need simply be pressed down and backrest 5 pushed towards the seat. The pressure exerted on bar 48 turns levers 44 about the hinge point with bars 45, thus releasing pegs 47 from recesses 46. Levers 44 are released from levers 23 and bars 6 and 16 are left free to turn towards each other. The pressure exerted on backrest 5 closes the V's defined by bars 6 and 16 and turns bar 25, together with members 13, clockwise as shown in Fig.4. It should be pointed out that push-chair 1 may be folded up regardless of the starting position of backrest 5 and bars 25. In fact, should bar 25 be positioned as shown by the dotted line in Fig. 1, once levers 44 are released from pegs 47, rotation of backrest 5 releases bar 25 automatically from teeth 43 and engages it on teeth 34. Vice versa, push-chair 1 is opened by simply turning backrest 5 or bar 25 engaged on teeth 34 the opposite way, so as to lock together levers 23 and 44 and reset bars 45 for bracing bars 6 and 16.

The advantages of the present invention will be clear from the foregoing description.

In particular, it provides for a push-chair with a fold-up system of straightforward design and troublefree operation, whereby levers 23 and 44 need simply be released by pressing bar 48, and backrest 5 turned towards the seat. Furthermore, push-chair 1 is provided with a bar 25 which may be set easily in the aforementioned positions for varying the position of the user in relation to the child. Finally, push-chair 1 is simple and cheap to make and lightweight.

To those skilled in the art it will be clear that changes may be made to push-chair 1 as described and illustrated herein without, however, departing from the scope of the present invention.

CLAIMS

1. A push-chair with a perfected fold-up system, the said push-chair comprising a collapsible load-bearing structure fitted with a collapsible body having a backrest and a seat; characterised by the fact that the said structure comprises:

—two first side bars, each supporting, at the bottom, at least a first wheel, and each hinged at the top to a respective member located to the side of the said body;

—two second side bars, each supporting, at the bottom, at least a second wheel, and each hinged at the top to a respective said member; the said first and second bars defining two respective V's with their tips in the respective said members;

—two first levers, each hinged to a respective said second bar;

—two second levers, each hinged to a first end of a respective third bar, the second end of which is hinged to a respective said first bar;

—a fourth bar in the form of an upside-down U and having a centre portion constituting a handgrip, and two side arms, each connected to a respective said first lever; and

—locking and release means between the said first and second levers, which levers may be locked in the open position, in such a manner as to cause the said third bars to act as tension rods between the said first and second bars, and released for collapsing the push-chair, by enabling the said first and second bars to turn towards each other.

2. A push-chair as claimed in Claim 1, characterised by the fact that the said means comprise two first pegs, each extending from a respective said first lever for engaging, in the open position, a recess formed along the edge of the said second lever; engagement of the said first pegs in the respective said recesses preventing rotation of the said second levers about the hinge point with the said third bars.

3. A push-chair as claimed in Claim 2, characterised by the fact that the said second levers are connected integral by means of a

fifth horizontal bar to which is fitted a first spring for pressing the said edge in which is formed the said recess against the respective said first peg.

4. A push-chair as claimed in Claim 3, characterised by the fact that the said first spring is fitted to a sixth horizontal bar designed to connect the said second bars and located lower down than the said fifth bar.

5. A push-chair as claimed in claim 3 and/or 4, characterised by the fact that the said second levers are substantially triangular in shape, are hinged by the upper tip to the said third bars, present a lower tip integral with the said fifth bar, and having the said recess on the upper edge.

6. A push-chair as claimed in at least one of the foregoing Claims, characterised by the fact that the free ends of the said fourth bar are hinged to the said first levers; the said fourth bar being allowed to assume a first position wherein the user gripping the said centre portion is positioned behind the said backrest, and a second position wherein the user is positioned facing the child; the said fourth bar being provided with a locking and release system comprising a sleeve designed to slide along the said arms from which extends a respective second peg engaging a slot formed in the said sleeve and in which is fitted a second spring for pressing upwards the said sleeve from which extend two opposite appendices in which are formed cavities, one of which cavities is engaged in the said first position by a first tooth formed on the rear of the said member, and the other of which is engaged in the said second position by a second tooth formed on the front of the said member.

7. A push-chair as claimed in at least one of the foregoing Claims, characterised by the fact that it is provided with a mechanism for tilting back the said backrest in a number of positions.

8. A push-chair with a perfected fold-up system, substantially as described and illustrated herein with reference to the accompanying drawings.